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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,326	02/23/2004	Sang-Hoon Lee	SAM-0569	8724

7590

11/30/2005

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EXAMINER

CHEN, KIN-CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/784,326	Applicant(s) LEE ET AL.	
	Examiner Kin-Chan Chen	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>022304;011105</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 102

2. Claims 1, 4-7, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Chung (US 2002/0019113).

In a method for forming STI and memory device, Chung teaches that a first oxide layer, a first conductive layer, and a nitride layer may be formed. The nitride layer, the first conductive layer, and the first oxide layer may be etched and patterned. A trench may be formed in the substrate by etching a portion of substrate adjacent to the first conductive layer pattern. The trench may be cured using a compound including nitrogen (e.g., NO). A second oxide layer may be formed on a bottom and a sidewall of the trench and a field oxide may be formed to fill up the trench. The curing may be performed through an annealing at about 800 °C. The second oxide layer is formed through an in-situ process. The second oxide may be formed at about 700-800 °C. See [0040], [0044], [0045].

As to dependent claims 10 and 11, see [0045] and [0048].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung (US 2002/0019113).

In a method for forming STI and memory device, Chung teaches that a first oxide layer, a first conductive layer, and a nitride layer may be formed. The nitride layer, the first conductive layer, and the first oxide layer may be etched and patterned. A trench may be formed in the substrate by etching a portion of substrate adjacent to the first conductive layer pattern. The trench may be cured using a compound including nitrogen (e.g., NO). A second oxide layer may be formed on a bottom and a sidewall of the trench and a field oxide may be formed to fill up the trench. The curing may be performed through an annealing at about 800 °C. The second oxide layer is formed through an in-situ process. The second oxide may be formed at about 700-800 °C. See [0040], [0044], [0045].

Claim 8 differs from Chung by specifying well-known feature (such as oxide is medium temperature oxide) to the art of semiconductor device fabrication, the examiner takes official notice. A person having ordinary skill in the art would have found it obvious to modify Chung by adding any of same well-known feature to same in order to provide uniform process with a reasonable expectation of success.

Dependant claim 9 differs from Chung by specifying various sizes and dimensions (thickness of the oxide layer). Because same are merely a matter of choices of design depending on the product requirements, it would be obvious to one skilled in the art to use various thicknesses for fabricating a semiconductor device in order to accommodate the specific product design and meet the product requirement.

5. Claims 2, 3, and 12-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung (US 2002/0019113) in view of the conventional method described in Figs. 1A and 1B of Chung (US 2002/0019113).

In a method for forming STI and memory device, Chung teaches that a first oxide layer, a first conductive layer, and a nitride layer may be formed. The nitride layer, the first conductive layer, and the first oxide layer may be etched and patterned. A trench may be formed in the substrate by etching a portion of substrate adjacent to the first conductive layer pattern. The trench may be cured using a compound including nitrogen (e.g., NO). A second oxide layer may be formed on a bottom and a sidewall of the trench and a field oxide may be formed to fill up the trench. The curing may be performed through an annealing at about 800 °C. The second oxide layer is formed

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through an in-situ process. The second oxide may be formed at about 700-800 °C. See [0040], [0044], [0045].

The invention of Chung does not teach using nitride layer as a mask for etching the trench, the conductive layer, and the oxide layer. However, Chung discloses that it is a conventional method (Figs. 1A and 1B, [0010] and [0011]). Hence, it would have been obvious to one with ordinary skill in the art to use nitride layer rather than HTO as mask in the invention of Chung because Chung discloses that it is a conventional method to use nitride layer as a mask for etching the trench, the conductive layer, and the oxide layer.

Claim 16 differs from Chung by specifying well-known feature (such as oxide is medium temperature oxide) to the art of semiconductor device fabrication, the examiner takes official notice. A person having ordinary skill in the art would have found it obvious to modify Chung by adding any of same well-known feature to same in order to provide uniform process with a reasonable expectation of success.

Dependant claim 16 differs from Chung by specifying various sizes and dimensions (thickness of the oxide layer). Because same are merely a matter of choices of design depending on the product requirements, it would be obvious to one skilled in the art to use various thicknesses for fabricating a semiconductor device in order to accommodate the specific product design and meet the product requirement.

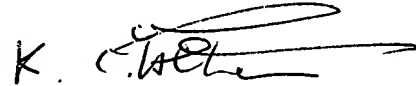
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to y whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 28, 2005



Kin-Chan Chen
Primary Examiner
Art Unit 1765